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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/659,361	09/12/2000	Leslie Wilfred Benum	NOVA 9210	4852

7590

10/01/2003

Kenneth H Johnson
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EXAMINER

MCNEIL, JENNIFER C

ART UNIT

PAPER NUMBER

1775

DATE MAILED: 10/01/2003

J

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/659,361

Applicant(s)

BENUM ET AL.

Examiner

Jennifer C. McNeil

Art Unit

1775

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) 23-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 1.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-22, drawn to a stainless steel and coating composition, classified in class 428, subclass 469.
- II. Claims 23-25, drawn to a thermal cracking process, classified in class 585, subclass 648.
- III. Claims 26-31, drawn to a process for altering the enthalpy of a fluid, classified in class 165, subclass 134.1.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process such as reforming.

Inventions I and III are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the product as claimed can be used in a materially different process such as reforming.

Inventions II and III are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different functions in that thermal cracking results in a chemical conversion whereas altering the enthalpy does not result in a chemical change.

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Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation between Examiner Griffin and Kenneth Johnson on August 26, 2003 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-22. Affirmation of this election must be made by applicant in replying to this Office action. Claims 23-31 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Badwal et al (US 5,942,349) in view of Virkar et al (US 6,054,231). Badwal teaches a fuel cell interconnect device wherein the device may be made of steel and is coated with a spinel of the formula MnCr_2O_4 . The oxide is known to provide stability to the electrode material. Badwal teaches that an effective thickness to

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provide the desired effect is 1-5 microns (col. 3, line 65- col. 4 line 22). Badwal does not specifically teach that the interconnect may be composed of stainless steel. Virkar teaches a solid oxide fuel cell interconnector wherein the interconnect device may be formed of stainless steel and is coated with a layer of MnCr_2O_4 . While it is shown by Virkar that stainless steel is a type of steel useful for the interconnect device, it would have been obvious to one of ordinary skill in the art at the time of the invention to form the interconnect device of Badwal of stainless steel, as it has been shown by Virkar that stainless steel is fully capable of performing the desired functions and is compatible with the same oxide coatings, and therefore would fully be expected to be a successful substitution for the other steels named by Badwal.

Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-141545. JP '545 teaches a stainless steel with improved corrosion resistance. The steel is coated with MnCr_2O_4 with a thickness greater than 500 angstroms. While JP '545 does not specifically teach that the oxide is in spinel form, it is the position of the examiner that absent a showing otherwise the oxide is spinel. Regarding the thickness, while JP '545 does not specify a thickness in the range claimed, absent a showing of unexpected results, it would have been obvious to one of ordinary skill to provide the oxide in a thickness sufficient to prevent corrosion of the underlying steel.

Regarding claim 2, Cr may be 16-19 wt%, and Mn may be less than 1 wt% (see Table 1).

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 55-141545 in view of Benum et al (US 5,630,887). JP '545 teaches a stainless steel substrate with improved corrosion due to the oxide coating as discussed above. JP '545 does not give additional examples stainless steel compositions. Benum teaches a treatment of stainless steel furnace tubes. This treatment provides an oxidation of the metal, resulting in a surface high in Mn and Cr. As it is shown by JP '545 that a coating of MnCr_2O_4 is suitable to provide corrosion resistance to a stainless steel surface, and Benum teach

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treatment of stainless steel surfaces by providing an oxide coating high in Mn and Cr, it would have been obvious to one of ordinary skill to use a stainless steel substrate of Benum as the substrate of JP '545 as it is clearly shown to be compatible with an oxide coating high in Cr and Mn, and it is shown that the stainless steel may be protected by a such an oxide coating treatment. Furthermore, absent a showing of unexpected results, it would have been obvious to use any known stainless steel as the substrate of JP '545, for the purpose of providing the stainless steel with corrosion resistance means.

Regarding claims 3 and 4, the composition of Benum is commensurate with the claims.

Regarding claims 5-7, the coating of JP '545 and Benum are not limited to a certain surface area and are therefore considered to be covering not less than 95% of the substrate.

Regarding claims 11-13, Benum teach the stainless steel in the form of tubes.

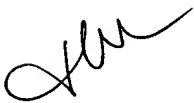
Regarding claims 14-22, these claims are considered intended use and do not further limit the claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer C. McNeil whose telephone number is (703) 305-0553. The examiner can normally be reached on 9-6, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (703) 308-3822. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-0611.



JCM
September 21, 2003